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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,604	01/08/2002	Kyung-jin Lee	030681-354	7771

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EXAMINER

FALASCO, LOUIS V

ART UNIT	PAPER NUMBER
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1773

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DATE MAILED: 06/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/038,604

Applicant(s)

LEE ET AL.

Examiner

Louis Falasco

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

PAPERS RECEIVED

Applicants' Information Disclosure statements received 05/06/02, 09/03/02, and 01/10/03 are acknowledged as papers 4, 5 and 6.

CLAIMS

The claims are 1 to 16.

All claims are under consideration.

ACTIONS

Statutory Basis

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Rejections

1. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as unpatentable over or **Hirayama et al** (cited by applicants - US 6083599).

Hirayama et al teaches a perpendicular magnetic recording media having an under layer for leading perpendicular orientation of a magnetic layer, stacked between a substrate and the perpendicular layer. The thickness of the perpendicular layer magnetic recording layer overlaps the 5 – 40 nm thickness required by the claims.

- In **Hirayama et al** see the magnetic recording element with the under layer between the perpendicular magnetic layer and substrate shown in Fig. 1 and pointed out at col. lns 8 to 10, col. 4 ln 68 to col. 5 ln 17, especially note “Embodiment 2” *cf* thickness variations in relation to coercivity illustrated in Fig.4, also thickness variations in relation to field fluctuations in Fig. 5; thickness variations in relation to reproduction output in Fig. 6 and thickness variations in relation to noise in Fig. 7 and 8.

In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” courts have held a prima facie case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

Further when a claim reciting a layer thickness (protective layer) within a prior art range courts have held a prima facie case of obviousness exists. *In re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997)

- In the instant situation thickness overlap and **Hirayama et al** shows the variations in Coercivity that result - illustrated in Fig.4, also thickness variations in relation to Field Fluctuations in Fig. 5; thickness variations in relation to Reproduction Output in Fig. 6 and thickness variations in

relation to Noise in Fig. 7 and 8. So that suitable thickness for magnetic characteristics such as Coercivity, Field Fluctuations, Reproduction Output and Noise are provided if the magnetic recording layer is between 5-40 nm. **Hirayama et al** directly teaches a thickness within applicants' claimed range.

The claims call the magnetic layer with the thickness to have a *negative nucleation*, though the negative nucleation is not specified in **Hirayama et al**, however the effect of the layer appears to be merely inherent in its thickness. **Hirayama et al** teaches the Co Cr Pt alloy composition for the magnetic layer.

The claiming of a negative nucleation property appearing inherently present - though unidentified in **Hirayama et al** - does not necessarily make these claims patentable.

Where claimed and prior art products have been shown to be substantially identical in structure or composition or produced by identical processes and a case of anticipation or prima facie obviousness has been established. The burden of proof shifts to applicant to show prior art products do not necessarily nor inherently possess the characteristic of the claimed product - see In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977).

2. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hirayama et al** as applied to claim 1 and 7 above, with **Futamoto et al** (US 6447936) in further in view of **Lee et al** (Effects of Magnetic Layer ... J. of Magnetism and Magnetic Materials).

While **Hirayama et al** teaches having an under layer, it is not a Ti under layer. **Futamoto et al** demonstrates the Ti under layer and directs its adaptation to Co alloyed magnetic layers is well known in the art of magnetic recording media.

- **Futamoto et al** – note under layers in the Drawings and see col. 1 ln 46 and col. 2 ln 66.

Lee et al shows the nucleation field is strongly influenced by the CoCrPt/Ti layered perpendicular materials, forming an increase in negative nucleation in the magnetic layer of the media, raising the recording density.

- **Lee et al** – see Fig. 7 and first paragraph of page 297.

It would have been *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to adopt the teachings of **Futamoto et al** of having a Ti under layer in **Hirayama et al** since **Lee et al** teaches the Ti under layer for Co alloyed magnetic strata in magnetic media.

One skilled in the art would have been motivated to adopt **Futamoto et al** and **Lee et al** for the purpose of controlling grain grown (**Lee et al** the page 299 and paragraphs 3.2 *Magnetic and structural properties of CoCrPt/Ti/CoZr*) and increase the coercivity of the of magnetic layer (page 301 of **Lee et al** and col. 1 ln 43 in **Futamoto et al**).

3. Claims 2 to 6 and 8 to 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hirayama et al** as applied to claims 1 and 7 above, and **Snoke et al** (Composite Perpendicular Recording Medium . . . IEEE Transactions on Magnetics) in view of **Lee et al** (Effects of Magnetic Layer ... J. of Magnetism and Magnetic Materials).

While **Hirayama et al** does not show a wide variation of Co, Cr and Pt present in the magnetic layer, they do not show the variation of Co, Cr and Pt in a ration precisely like that of the claims. **Sonobe et al** however, shows that varying the ratio of Co, Cr and Pt is well know, and it's a matter of choice with trade offs as to obtaining a increase signal amplitude and media noise from the magnetic media - this is evident from Table I compositions of CoCrPt alloys and are also noted in Paragraph I. Introduction on page 2769. In **Sonobe et al** the composition may be $(Co_{72}Cr_{28})_{100-x}Pt_x$ [where x is from 17-22] and beyond as illustrated by Table 1 and noted in the last two paragraphs of col. 1 on page 2769.

It would be have been obvious to one having ordinary skill in the art at the time the invention was made to adopt **Sonobe et al** and vary the relative amounts of CoCrPt alloy of the primary references in further view of the teachings of **Lee et al** that the nucleation in the perpendicular magnetic layer is strongly influenced by the CoCrPt composition and the composition may vary in the magnetic media to control the recording density of the media (**Lee et al** - see Fig. 7 and first paragraph of page 297). One skilled in the art would have been motivated to adopt the **Snoke et al** and **Lee et al** CoCrPt alloyed magnetic layers in any of the primary references with the expectation of

increasing the output and resolution of the magnetic media and increasing control over the recording density of the media.

OTHER REFERENCES

- **Zou et al** (US 6432563) is cited as being of interest showing the perpendicular layer magnetic recording layer is within the 5 – 40 nm thickness. In **Zou et al**, see Fig. 12 – the under layer between the perpendicular magnetic layer and substrate col. 9 lns 4-15; the thickness of the magnetic layer recited at col. 17 lns 2, 3 and col. 18 lns 17-23.
- **Ross et al** (US 6156404) and **Margulies et al** (US 6183832) are cited as being of interest showing magnetic recording layer is within the 5 – 40 nm thickness.
- **Bertero et al** (US 6500567) is cited as being of interest showing magnetic recording layer is within the 5 – 40 nm thickness

CONCLUSION

The claims are 1 to 17.


- Restriction has been required.
- No claim has been allowed.
- No Information Disclosure Statement has been received.

INQUIRES

Any inquiry concerning this communication from the examiner should be directed to examiner Lou Falasco, whose telephone number is 703.305-6974. The examiner can normally be reached M-F 9:30 AM - 6:00 PM.

- If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Paul Thibodeau may be reached at 703.308-2367.
- The Fax phone numbers for the organization where this application or proceeding is assigned are: 703.872-9310 for regular communications and 703.872-9311 for After Final communications.
- An inquiry of a general nature or relating to status of this application or proceeding should be directed to the TC 1700 receptionist whose telephone number is 703.308-0651.

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06/03


STEVAN A. RESAN
PRIMARY EXAMINER